Growth and Development Profile of Indian Children with Down Syndrome

In this retrospective study, we describe the profile of 88 children with Down syndrome. The average BMI for children showed a progressive increase with age. Compared to the previously published development profile, there was a significant improvement in the language domain.

Key words: *Development, Down syndrome, Growth, India.*

Down syndrome is the most common genetic cause of learning disability [1]. Children with the syndrome fall behind the normal population in both growth and growth velocity [2]. Their development is usually related to the intelligence level [3]. The present study looks at the anthropometry and developmental profile of children with DS based on their karyotype.

The study was a retrospective study using case notes from Unit's database of 5 years from January 2006 to December 2010. Children who had a clinical and cytogenetic diagnosis of down syndrome as per ICD-10 diagnostic criteria were included in the present study. Those who had perinatal asphyxia of HIE stage II and above, congenital hypothyroidism, congestive cardiac failure, renal failure, or epilepsy were excluded from the present study. Calibrated instruments were used to measure the height, weight and head circumference as per standard guidelines. The developmental history along with a detailed developmental assessment was performed on all children. Chromosomal analysis was performed on phytohaemagglutinin-stimulated cultures of peripheral blood using standard techniques [4]. Data were compiled on SPSS 12.0 for Windows (SPSS Inc., IL). ANOVA and student t-test were used for comparing variables.

Eighty eight children fulfilled the inclusion criteria, of which 88% had trisomy. The general characteristics of the children are summarized in ***Table* I**. Growth in Down syndrome is prenatally reduced [5] and birthweight and length are reduced by 0.5 SD from average [6]. The birth weight of children in our study was near normal, as also reported previously [7]. There is a tendency to have growth failure in the first 2 years and a progressive improvement in growth after that with a tendency to be overweight by age 3 years [8]. The average BMI for children less than two years of age, between 2 and 3 years of age and older children, showed a progressive increase *viz.*, 15.59, 15.82 and 16.15 kg/m^2, respectively. However, the difference was not statistically significant.

There was a definite delay in motor and verbal development in children with trisomy; however, there was only a developmental lag in achieving the social skill of reciprocal smile across all groups. The relative strengths in the syndrome are social and visuo-spatial skills, while verbal skills and motor planning are weak [9]. The generalized hypotonia in children with Down syndrome might be one of the causes for a delayed head control compared to turning over in the study children. The mean age of achievement of developmental milestones in children with translocation and mosaicism was better than

TABLE I CHARACTERISTICS OF CHILDREN WITH DOWN SYNDROME

	Trisomy (76)	Translocation (5)	Mosaic (5)	Double trisomy (2)
	47	4	5	1
Age of first visit (y)	4.4	2.33	1.775	0.84
Growth height <25th centile*	29	40	20	50
Weight <25th centile*	44	20	80	50
HC <3rd centile (%)	80	80	0	100
Development in mo (SD)				
Head control	10.92 (5.4)	5.76 (1.3)	5.04 (3.7)	7.5 (2.2)
Turn over	7.32 (4.4)	7.5 (2.2)	5.76 (3.7)	11$^{\#}$
Sit independently	16.44 (8.2)	11.28 (1.3)	10.68 (2.4)	22.8 (1.7)
Stand independently	24.24 (10.4)	18$^{\#}$	12$^{\#}$	26$^{\#}$
Walk independently	30.72 (12)	30$^{\#}$	16$^{\#}$	-
First specific word	30.36 (13.2)	27.36 (28.3)	12$^{\#}$	17$^{\#}$
Social smile	5.88 (5.4)	3.5 (0.7)	4.32 (2.9)	5$^{\#}$

** On Down Syndrome charts; $^{\#}$Data of single child; SD: Standard Deviation; HC: Head circumference.*

that of children with trisomy. Compared to the previous report of development in Indian children with this syndrome [10], the motor and social development in children with trisomy was similar. Significant improvement ($P<0.001$) was seen in speaking. Children with trisomy spoke by 30.36 months *vs* 42.4 month in the earlier report [10]; probably due to early diagnosis, interventions, and improved socio-economic environment. In conclusion, the secular trends in development of Indian children with Down syndrome over the last three decades show similar motor and social development profile with improvement in language domain. Further studies need to standardize growth charts for Indian children with Down syndrome and evaluate the deviations in growth and development in these children.

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HIV Antibody Tests for Young Infants: a Lost Opportunity to Detect Negative Status

The most frequently posed question is 'Is my child HIV negative?' Unfortunately it is difficult to answer this in situations with no facility for virological assays. The present guidelines categorically state that rapid HIV antibody testing is not recommended in HIV-exposed infants less than 18 months of age because of persisting maternal antibodies. DNA PCR or RNA qualitative tests are the recommended tests [1-4]. This recommendation is focused on detecting HIV-infected infants, not the HIV negative.

In our scenario, DNA PCR is expensive, not freely available, needs repeated testing and has longer reporting time. Rapid HIV antibody tests have the potential to detect negative status and are underutilized due to ignorance in interpretation of results. Early detection of negative status is useful to assess effectiveness of PPTCT interventions, limit need for long-term follow up and allay parental anxiety. National AIDS Control Organization (NACO) has only recently introduced DNA PCR for infant testing in a phased manner. They recommend DNA PCR in children <6 months, and rapid test for those >6 months with DNA PCR in this age group only if rapid test is positive.

We assessed the utility of HIV rapid tests in HIV-exposed infants less than 18 months of age to detect negative status.

This was a retrospective, descriptive study, between January 2006 to August 2010 at St. John's Medical College Hospital, Bangalore. We included all HIV-exposed infants less than 18 months, registered in our comprehensive PPTCT program. All infants underwent rapid HIV antibody test and confirmatory DNA PCR tests